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3/27/87
(signed)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

OHIO ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF:	
ORMET CORPORATION Monroe County Hannibal, Ohio	ADMINISTRATIVE ORDER BY CONSENT RE: REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
RESPONDENT,	U.S. EPA Docket No.
Proceeding under Section 122(a) and (d)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended and Sections 3734.13, 3734.20 and 6111.03 of the Ohio Revised Code.	

The United States Environmental Protection Agency ("U.S. EPA"), the Ohio Environmental Protection Agency ("OEPA") and Ormet Corporation ("Respondent") have each agreed to the making and entry of this Administrative Order by Consent ("Consent Order").

I. JURISDICTION

A. This Consent Order is issued pursuant to the authority vested in the President of the United States by Section 122(a) and (d)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499 ("CERCLA"), and delegated to the Administrator of the U.S. EPA on January 23, 1987, by Executive

Order 12580, 52 Federal Register 2923, and further delegated to the Assistant Administrator for Solid Waste and Emergency Response and the Regional Administrators by U.S. EPA Delegation No. 14-14-C on February 27, 1987. This Consent Order is also issued pursuant to the authority vested in OEPA by Ohio Revised Code (ORC) §§3734.13, 3734.20 and 6111.03.

B. The Respondent to this Consent Order agrees to undertake all actions required by the terms and conditions hereunder, and consents to and will not contest or legally challenge the issuance of this Consent Order or the U.S. EPA's or OEPA's jurisdiction regarding this Consent Order.

II. NOTICE OF ACTION

U.S. EPA shall notify the Federal Natural Resource Trustee of this action pursuant to the requirements of Section 122(j) of CERCLA. Such notice shall be given no later than the date this Consent Order is made available to the public for review and comment pursuant to Section XXXI of this Consent Order.

III. PARTIES BOUND

A. This Consent Order applies to and binds the following persons as defined in Section 101(21) of CERCLA:

(1) U.S. EPA, through the Regional Administrator, Region V;
(2) OEPA, through the Director;
(3) the following person as defined in Section 101(21) of CERCLA, herein referred to as the "Respondent":
Ormet Corporation
(4) the successors and assignees of the Respondent.

B. The undersigned representatives of the U.S. EPA, OEPA

and Respondent certify that they are fully authorized to enter into the terms and conditions of this Consent Order and to execute and legally bind such party to this document.

C. No change in ownership, corporate, or partnership status shall in any way alter the status or responsibility of the Respondent under this Consent Order. Each party shall be responsible for ensuring that their respective contractors, consultants, firms and other persons or entities acting under or for it with respect to matters included herein comply with the terms of this Consent Order.

IV. STATEMENT OF PURPOSE

A. In entering into this Consent Order, the mutual objectives of the U.S. EPA, OEPA and the Respondent are for the Respondent: (1) to conduct a remedial investigation (RI) to determine the nature and extent of the release or threatened release of hazardous substances, pollutants or contaminants from the Facility and (2) to perform a feasibility study (FS) to identify and evaluate alternatives for the appropriate extent of remedial action, if any, to prevent or mitigate the migration of any release or threatened release from the Facility of hazardous substances, or of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare.

B. The activities conducted pursuant to this Consent Order are subject to approval by the U.S. EPA and OEPA as provided, shall employ sound scientific, engineering and construc-

tion practices and shall be consistent with the National Contingency Plan, 40 CFR § 300 et seq. as amended, ("NCP") and CERCLA.

V. FINDINGS OF FACT

Based upon information available on the effective date of this Consent Order, the Regional Administrator of the U.S. EPA, Region V, and the Director of the OEPA make the following findings:

A. Ormet Corporation is a Delaware corporation licensed to do business in Ohio.

B. The Ormet site (hereinafter "the Facility") is located between the west bank of the Ohio River and Ohio State Route # 7, near Hannibal, Ohio, on the northeastern half of a lens-shaped stretch of land approximately 2.5 miles long and about .5 miles wide, at its widest point. Several former lagoons and a former potliner storage area are located on the northeastern portion of the property.

C. A primary aluminum production plant is operated on the Facility. The main plant operation is the conversion of alumina (Al_2O_3) into aluminum. The process utilizes powdered alumina which is dropped into molten cryolyte (Na_3AlF_6). An electric current of approximately 85,000 amperes is then passed from a carbon anode, through the solution, to a cathode lining. The electricity breaks the alumina down into molten aluminum and oxygen. The oxygen combines with carbon from the anode blocks and is vented as carbon dioxide, while the aluminum collects in a molten

pool. Ancillary operations include production and baking of carbon anodes for consumption in the electrolytic process outlined above.

D. Analyses conducted for Respondent of sludge from Ponds 1-5 show the following concentrations:

fluoride	2 - 218 mg/l
dissolved solids	200 - 2,400 mg/l
cyanide	<0.01 - 0.45 mg/l
ammonia	<0.01 - 1.52 mg/l

A report prepared for Respondent dated November 21, 1977 stated that the chemical composition of waste pot liners stored at the Facility included:

aluminum oxide	38%
carbon	30%
fluoride	10 - 15%

During a NPDES Compliance Sampling Inspection conducted in June 1984, surface sediment samples from Pond 5 showed the following concentrations:

phenolics	1.0 mg/kg
cyanide (total)	120 mg/kg
phenanthrene	13 mg/kg
anthracene	10 mg/kg
fluoranthene	12 mg/kg
pyrene	12 mg/kg
crysene	8.4 mg/kg
benzo(a) anthracene	9.0 mg/kg
benzo(a) pyrene	160 mg/kg

Benzo(a) anthracene and benzo(a) pyrene are documented carcinogens. Analyses conducted for Respondent of groundwater samples collected in May 1985 from Monitoring Well 2 showed the following concentrations:

total dissolved solids	6090 mg/l
fluoride	400 mg/l
total cyanide	95 mg/l

Analyses conducted for Respondent of groundwater samples collected in May 1985 from Monitoring Well 18 showed the following concentrations:

total dissolved solids	6340 mg/l
fluoride	410 mg/l
total cyanide	35.2 mg/l

Analyses of samples collected in June, 1984 during a NPDES Compliance Sampling Inspection in 1984 from interceptor wells located near the Facility's Ranney Well show the following concentrations:

total fluoride	35 mg/l
total cyanide	5.3 mg/l

Analyses of samples collected in June, 1984 during the same NPDES inspection from the interceptor well located by Monitoring Well 17 show the following concentrations:

total fluoride	23 mg/l
total cyanide	1.15 mg/l

Wastes containing the constituents listed above are by-products of operations at the Facility.

E. The Facility is underlain by alluvial deposits composed mainly of sand, with areas of silty clay and/or pebbles. Alluvial deposits under the site range from 60 to 100 feet in depth and rest on bedrock consisting of sedimentary rocks. Ground water generally occurs between 30 and 40 feet below ground surface and under natural conditions flows from north to south across the Facility, discharging into the Ohio River.

F. A well on the property of another plant located adjacent to the Facility provides drinking water for approximately 2300

employees who work at that plant and the Facility.

G. Based on results of U.S. EPA and OEPA investigations and taking into account such factors as populations at risk, the potential of hazardous substances being present, and the potential for contamination of drinking water supplies, the Facility was included in Group 3 of the fourth proposed update to the National Priorities List in the Federal Register on September 18, 1985. See 50 Federal Register 37950. On November 18, 1985, Respondent filed comments with U.S. EPA presenting data which disputes the bases of the proposed listing of the Facility on the National Priorities List.

H. A reasonable time for beginning and completing the actions required by this Consent Order has been provided for, and the Respondent has agreed to undertake the actions ordered by the U.S. EPA and OEPA in this Consent Order.

VI. CONCLUSIONS OF LAW

Based upon information available on the effective date of this Consent Order, the Regional Administrator of the U.S. EPA, Region V, and the Director of OEPA make the following conclusions of law:

A. The Ormet site is a "facility" as defined in Section 101(9) of CERCLA.

B. The Respondent is a "person" as defined in Section 101(21) of CERCLA and Section 3734.01 (G) of the ORC.

C. The Respondent is an "owner and operator" of the Facility within the meaning of Section 107(a) of CERCLA.

D. The Respondent may be a liable person pursuant to Section 107 of CERCLA and is a potentially responsible party for the purposes of Section 122 of CERCLA for the reasons set forth in Section V of this Consent Order.

E. "Hazardous substances" as defined in Section 101(14) of CERCLA and "industrial waste" as defined in Section 6111.01 (C) of the ORC have been deposited, stored, disposed of, placed, or located at the Facility.

F. The past, present and/or potential migration of hazardous substances from the Facility constitutes an actual and/or threatened "release" into the "environment" as those terms are defined in CERCLA and constitutes a discharge of industrial waste into "waters of the state" as that term is defined in Section 6111.01 (H) of the ORC.

VII. DETERMINATIONS

Based on the foregoing Findings of Fact and Conclusions of Law, the Regional Administrator of U.S. EPA, Region V, and the Director of OEPA have determined that:

A. Respondent will promptly and properly take appropriate response action at the Facility by conducting a Remedial Investigation and Feasibility Study ("RI/FS") and is qualified to perform the RI/FS; and

B. The actions set forth in this Consent Order are in the public interest and are consistent with the NCP and CERCLA.

VIII. COMPLIANCE WITH APPLICABLE LAWS

All work undertaken by the Respondent pursuant to this Consent Order shall be performed in compliance with all applicable Federal and State laws and regulations, including but not limited to all Occupational Health and Safety Administration and Department of Transportation regulations. The Respondent shall be responsible for obtaining all State or local permits which are necessary for the performance of any work hereunder.

IX. WORK TO BE PERFORMED

A. All work to be performed by the Respondent pursuant to this Consent Order shall be under the direction and supervision of a qualified professional engineer or certified geologist. Respondent has selected Geraghty & Miller, Inc. to direct and supervise all work to be performed pursuant to this Consent Order. U.S. EPA and OEPA approve Respondent's selection of Geraghty & Miller, Inc. Prior to the initiation of work at the Facility by any professional engineer or certified geologist other than Geraghty & Miller, the Respondent shall notify the U.S. EPA and OEPA, in writing, of the name, title, and qualifications of the proposed engineer or geologist, and of the names of principal contractors and/or subcontractors proposed to be used in carrying out the work to be performed pursuant to this Consent Order. Selection of any such engineer or geologist or contractor and/or subcontractor shall be subject to approval by the U.S. EPA and OEPA.

B. Attachment I to this Consent Order provides a Statement of Work ("SOW") for the completion of the RI/FS which is incor-

porated into and made a part of this Consent Order. In the event of any conflict between any provisions of this Consent Order and the SOW, this Consent Order shall control in resolving such conflict.

C. The following work shall be performed:

1. Within twenty (20) business days of the effective date of this Consent Order, the Respondent shall submit a draft work plan to the U.S. EPA and OEPA for a Phase I Remedial Investigation (hereinafter Phase I RI Work Plan). The draft Phase I RI Work Plan shall be developed in conformance with the SOW, the standards set forth in Section 121 of CERCLA, U.S. EPA "Guidance on Remedial Investigations Under CERCLA", dated May 1985, as amended (the "RI Guidance"), and any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP.

2. The draft Phase I RI Work Plan shall be subject to review, modification and approval or disapproval by U.S. EPA and OEPA in accordance with the procedures set forth in Section X of this Consent Order.

3. Upon final approval of the Phase I RI Work Plan, Respondent shall proceed promptly to implement the work detailed in the Phase I RI Work Plan in accordance with the schedule set forth therein. Unless otherwise directed by U.S. EPA and OEPA, Respondent shall not commence Phase I field activities until U.S. EPA and OEPA approve the Phase I RI Work Plan.

4. U.S. EPA and OEPA shall review the data obtained by Respondent during the Phase I RI field activities and provide

Respondent with a written determination of what activities shall be required during Phase II of the RI.

5. Within twenty (20) business days of the later of receipt of the written determination or the conclusion of the dispute resolution procedure in Paragraph C of Section XX with regard to such written determination, Respondent shall submit a draft work plan to the U.S. EPA and OEPA for a Phase II RI (hereinafter Phase II RI Work Plan). The draft Phase II RI Work Plan shall be developed in conformance with the SOW, the standards set forth in Section 121 of CERCLA, the RI Guidance, and any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP.

6. The draft Phase II RI Work Plan shall be subject to review, modification and approval or disapproval by U.S. EPA and OEPA in accordance with the procedures set forth in Section X of this Consent Order.

7. Upon final approval of the Phase II RI Work Plan, Respondent shall proceed promptly to implement the work detailed in the Phase II RI Work Plan in accordance with the schedule set forth therein. Unless otherwise directed by U.S. EPA and OEPA, Respondent shall not commence Phase II RI field activities until U.S. EPA and OEPA approve the Phase II RI Work Plan.

D. Respondent shall submit a draft RI Report to U.S. EPA and OEPA within fourteen (14) calendar months of receipt of U.S. EPA and OEPA approval of the Phase I RI Work Plan. The RI

Report shall be prepared in accordance with the RI Guidance and any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP.

1. In the event that U.S. EPA and OEPA require Respondent to perform "additional work" pursuant to Section XIII of this Consent Order, the date specified above for submitting the draft RI Report shall be extended by the amount of time required to perform the additional work required, including the period of time required to plan and/or obtain approval from U.S. EPA and OEPA for the performance of such work.

2. The draft RI Report shall be subject to review, modificatio and approval or disapproval by U.S. EPA and OEPA in accordance with the procedures set forth in Section X of this Consent Order.

E. Concurrent with submittal of the draft RI Report required by the SOW, the Respondent shall submit a detailed Work Plan for the Feasibility Study, (hereinafter "FS Work Plan"), in accordance with the SOW, the standards set forth in Section 121 of CERCLA, U.S. EPA "Guidance on Feasibility Studies under CERCLA", dated April 1985, as amended (the "FS Guidance"), and any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP.

1. The draft FS Work Plan shall be subject to review, modification and approval or disapproval by U.S. EPA and OEPA in accordance with the procedures set forth in Section X of this Consent Order.

2. Upon final approval of the FS Work Plan, Respondent shall proceed promptly to implement the work detailed in the FS Work Plan in accordance with the schedule set forth therein. Unless otherwise directed by U.S. EPA and OEPA, Respondent shall not commence the FS until U.S. EPA and OEPA approve the FS Work Plan.

F. Within thirty-five (35) business days of receipt of U.S. EPA and OEPA approval of the FS Work Plan, Respondent shall submit a draft Technology Assessment Chapter of the FS Report to U.S. EPA and OEPA. The draft Technology Assessment Chapter shall be developed in conformance with the SOW, the FS Guidance, and any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP. The draft Technology Assessment Chapter shall be subject to review, modification and approval or disapproval by U.S. EPA and OEPA in accordance with the procedures set forth in Section X of this Consent Order.

G. Within one hundred thirty five (135) business days of receipt of U.S. EPA and OEPA approval of the FS Work Plan, or receipt by Respondent of the Endangerment Assessment prepared by U.S. EPA, whichever is later, Respondent shall submit a draft FS Report to be developed in conformance with the SOW, the FS Guidance, and any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP. The draft FS Work Plan shall be subject to review, modification and approval or disapproval by U.S. EPA and OEPA in accordance with the procedures set forth in Section X of this Consent Order.

H. When the Phase I RI Work Plan, the Phase II RI Work Plan, and the FS Work Plan are approved by U.S. EPA and OEPA, they each shall be attached to this Consent Order and incorporated into and made a part hereof.

I. All work shall be conducted in accordance with the NCP, the RI Guidance, the FS Guidance, any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP, and the requirements of this Consent Order, including the standards, specifications and schedule contained in the RI Work Plans and the FS Work Plan.

X. REVIEW AND APPROVAL PROCEDURES

1. With regard to each document that Respondent is required under this Consent Order to submit to U.S. EPA and OEPA for review and approval, U.S. EPA and OEPA shall notify Respondent in writing within thirty (30) business days after receipt of such document of approval or disapproval, or required modifications of the document, or any parts thereof, specifying deficiencies in the event of any disapproval or proposed modification. In the event that any document requires a longer review period, U.S. EPA and/or OEPA shall notify Respondent in writing of that fact within thirty (30) business days after receipt of the document. Regardless of whether U.S. EPA and/or OEPA give notice of such delay to Respondent, delay by Respondent in performance of the work under this Consent Order and the attached SOW due to U.S. EPA and/or OEPA document review time beyond thirty (30) business days shall

not be considered a violation of this Consent Order, and the time allowed for performance by Respondent shall be extended by the number of business days beyond thirty (30) business days that elapse before Respondent receives the written notice from U.S. EPA and/or OEPA relating to their review of such document.

2. Within ten (10) business days of receipt of the written notice required by Paragraph 1 of this Section, Respondent may request a meeting with U.S. EPA and OEPA to discuss and/or dispute any deficiencies specified in the notice or the necessity of any proposed modification to the document under review. Such meeting shall be held within five (5) business days of such request, if possible, and may be conducted by telephone.

3. Within twenty (20) business days of the date of the meeting or, if no meeting is requested by Respondent, within twenty (20) business days of the receipt of written notice of any deficiency and required modification to the document under review, Respondent shall submit a revised document to U.S. EPA and OEPA which incorporates the U.S. EPA and OEPA modifications as revised or amended as the result of any meeting held between the parties.

4. In the event of subsequent U.S. EPA and OEPA disapproval of any document, U.S. EPA and OEPA retain the right to conduct a complete RI/FS and/or to enforce the terms of this Consent Order.

XI. PROGRESS REPORTS

A. The Respondent shall provide monthly written progress reports to the U.S. EPA and OEPA according to the schedule contained in the Phase I RI Work Plan, the Phase II RI Work Plan and the FS Work Plan. At a minimum, these monthly written progress reports shall include the following:

1. A description of the actions which have been taken toward achieving compliance with this Consent Order;

2. A description of difficulties encountered in performing work during the reporting period and of actions taken or being taken to rectify problems.

3. All results of sampling and tests and all other raw data produced during the month and relating to the Facility;

4. All plans and procedures completed during the past month, as well as such actions, data, and plans which are scheduled for the next month;

5. Target and actual completion dates for each element of activity, including the project completion, and an explanation of any deviation from the schedules in the RI Work Plan and FS Work Plan schedule.

6. Changes in personnel.

F. The monthly written progress reports shall be submitted to the U.S. EPA and OEPA by the tenth business day of each month following the date of commencement of the work detailed in the Phase I RI Work Plan through the submission of the final FS Report.

XII. ADDRESS FOR ALL CORRESPONDENCE

Documents, including reports, approvals, disapprovals

and other correspondences to be submitted pursuant to this Consent Order, shall be sent by certified mail, return receipt requested, to the following Project Coordinators at the following addresses, or to such other addresses as the Respondent, OEPA or the U.S. EPA may hereafter designate in writing:

A. Documents to be submitted to the U.S. EPA Project Coordinator should be sent to:
Hazardous Waste Enforcement Branch (5HE-12)
Waste Management Division
U.S. Environmental Protection Agency
Region V
230 S. Dearborn Street
Chicago, Illinois 60604

Attn: Pauline LeBlanc, MN/OH, CES
Ormet Corporation RPM

B. Documents to be submitted to the OEPA Project Coordinator should be sent to:

Ohio Environmental Protection Agency
Division of Solid and Hazardous Waste Management
Southeast District Office
2195 Front Street
Logan, Ohio 43138

Attn: Ken Dewey

with an additional copy to:

Ohio Environmental Protection Agency
Superfund and Remedial Investigation Unit
Division of Solid and Hazardous Waste Management
361 E. Broad Street
Columbus, Ohio 43216-1049

C. Documents to be submitted to the Respondent's Project Coordinator should be sent to:

Ormet Corporation
P.O. Box 176
Hannibal, Ohio 43931

Attn: T.A. Hermeling

XIII. ADDITIONAL WORK

A. In the event that the U.S. EPA, OEPA or the

Respondent determines that additional work, including remedial investigatory work and/or engineering evaluation beyond the work already specified in the Phase I RI Work Plan, the Phase II RI Work Plan, or the FS Work Plan as such plans were initially approved by U.S. EPA and OEPA, is necessary to accomplish the objectives of the RI/FS, written notification of such additional work shall be provided to each of the other parties.

B. Any additional work determined to be necessary by the Respondent shall be subject to approval by the U.S. EPA and OEPA.

C. Any additional work determined to be necessary by the Respondent and approved by the U.S. EPA and OEPA or determined to be necessary by the U.S. EPA and OEPA, shall be completed by Respondent in accordance with the standards, specifications, and schedule determined or approved by the U.S. EPA and OEPA.

XIV. ACCESS

A. If U.S. EPA and OEPA determine that work is to be performed hereunder in areas owned by parties other than those bound by this Consent Order, the Respondent shall make its best efforts to obtain access agreements from such other owners within twenty (20) business days of such determination. Such agreements shall provide access for the U.S. EPA, OEPA and authorized representatives of the U.S. EPA and OEPA, as specified below. These agreements, if any, will be attached hereto. In the event that such access agreements cannot be obtained within the time referenced

above, the Respondent shall so notify the U.S. EPA and OEPA, and U.S. EPA and OEPA shall consider exercising their authority under CERCLA and/or the Ohio Revised Code to obtain access to insure that the RI/FS is completed. The U.S. EPA and OEPA reserve the right to terminate this Consent Order and to perform a RI/FS should the Respondent's inability to gain access to the Facility or other areas affect the Respondent's ability to perform the work required herein.

B. Authorized representatives of the U.S. EPA and OEPA shall be allowed access to the Facility at reasonable times by the Respondent, and other areas pursuant to any agreement obtained under paragraph A above, for purposes including, but not limited to: inspecting records, operating logs and contracts related to work under this Order; reviewing the progress of the Respondent in carrying out the terms of this Consent Order; conducting such tests, inspections, and sampling as the U.S. EPA and OEPA may deem necessary; using a camera, sound recording, or other documentary type equipment; and verifying the data submitted to the U.S. EPA and OEPA by the Respondent hereunder. The Respondent shall permit such authorized representatives upon reasonable notice to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, which pertain to this Consent Order. All persons with access to the Facility pursuant to the Consent Order shall comply with approved health and safety plans and with Respondent's health, safety and security procedures,

which shall be furnished to U.S. EPA and OEPA prior to the execution of this Consent Order.

C. Nothing herein shall be construed as restricting the inspection or access authority of the U.S. EPA or the OEPA under any law or regulation.

XV. PROJECT COORDINATORS

A. The U.S. EPA, OEPA and the Respondent have each designated a technical representative as their respective Project Coordinators as set forth in Section XII. Each Project Coordinator shall be responsible for overseeing the implementation of this Consent Order. The U.S. EPA Project Coordinator will be the U.S. EPA designated representative at the Facility. The OEPA Project Coordinator will be the OEPA's designated representative at the Facility. To the maximum extent possible, communications between the Respondent, OEPA and the U.S. EPA, and all documents, reports, approvals and other correspondences concerning the activities performed pursuant to the terms and conditions of this Consent Order, shall be directed through the Project Coordinators. Each Project Coordinator shall be responsible for assuring that all communications received from the other Project Coordinators are appropriately disseminated and processed. During implementation of the Phase I RI Work Plan, the Phase II RI Work Plan and the FS Work Plan, the Project Coordinators shall, whenever possible, operate by consensus and shall attempt

in good faith to resolve disputes informally through discussion of the issues.

B. The U.S. EPA, OEPA and the Respondent shall each have the right to change their respective Project Coordinators. Such a change shall be accomplished by notifying the other parties in writing at least five (5) business days prior to the change.

C. The U.S. EPA and OEPA Project Coordinators shall have at least the authority to: (1) take samples or direct the type, quantity and location of samples to be taken by the Respondent; (2) direct that work stop whenever they determine that activities at the Facility may create a present danger to public health or welfare or the environment; (3) observe, take photographs and make such other reports on the progress of the work as the Project Coordinator deems appropriate; and (4) review records, files and documents relevant to the Consent Order.

D. The U.S. EPA Project Coordinator shall have the authority vested in an On-Scene Coordinator and a Remedial Project Manager (OSC, RPM) by the National Contingency Plan, 40 CFR Part 300, as amended, including the authority to halt, conduct, or direct any work required by this Consent Order, or to direct any response action undertaken by the U.S. EPA when conditions at the Facility may present an imminent and substantial endangerment to the public health or welfare or the environment. In the event that the U.S. EPA Project Coordinator halts work pursuant to this

paragraph, the Respondent may request a modification of the schedule or work described in the Phase I RI Work Plan, the Phase II RI Work Plan, the FS Work Plan and this Consent Order.

E. The absence of the U.S. EPA or OEPA Project Coordinator from the Facility shall not be cause for stoppage of work.

F. Respondent's Project Coordinator or his designee shall be onsite during all hours of site work. For purposes of this provision, "site work" does not include the operation of automatic sampling equipment. The parties' respective Project Coordinator or designee shall be on call during the pendency of this Consent Order.

XVI. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. The Respondent shall make the results of all sampling and/or tests or other data generated by the Respondent, or on behalf of the Respondent, pursuant to implementation of this Consent Order, available to the U.S. EPA and OEPA, and shall submit these results in written monthly progress reports as required by Section X of this Consent Order.

B. At the request of the U.S. EPA or OEPA, the Respondent shall provide split or duplicate samples to the U.S. EPA or OEPA of any samples collected by the Respondent pursuant to the implementation of this Consent Order. The Respondent shall notify the U.S. EPA and OEPA at least fifteen (15) business days in advance of any sample collection activity.

C. Pursuant to applicable Federal and State laws and regulations, (Section 104(e) of CERCLA and 40 CFR Part 2 and Rule 3745-49-03 of the Ohio Administrative Code (OAC)), the Respondent may assert a confidentiality claim with respect to any or all of the information requested or submitted pursuant to the terms of this Consent Order. Such an assertion must be adequately substantiated when the assertion is made. Analytical data and other information described in Section 104(e)(7)(F) of CERCLA and Rule 3745-49-03 of the OAC shall not be claimed as confidential by the Respondent. Information determined to be confidential by the U.S. EPA in accordance with applicable federal laws and regulations will be afforded the full protection provided by such laws and regulations. Information determined to be confidential by OEPA pursuant to applicable state laws and regulations will be afforded the full protection provided by such laws and regulations. If no confidentiality claim accompanies information when it is submitted to the U.S. EPA and OEPA, or if information claimed as confidential is determined by the U.S. EPA or OEPA not to be confidential, the information may be made available to the public by the U.S. EPA or OEPA.

XVII. QUALITY ASSURANCE

A. The Respondent shall use quality assurance, quality control, and chain of custody procedures in accordance with U.S. EPA "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans" QAMS-005-80 (U.S. EPA, 1980c) throughout all data collection activities.

B. The Respondent shall consult with the U.S. EPA and OEPA Project Coordinators in planning for, and prior to, all sampling and analysis as detailed in either RI Work Plan. In order to provide quality assurance and maintain quality control with respect to all samples collected pursuant to this Consent Order, the Respondent shall:

1. Ensure that the U.S. EPA and OEPA personnel and/or the U.S. EPA and OEPA authorized representatives are allowed access to any laboratories and personnel utilized by the Respondent for analyses;

2. Ensure that all sampling and analyses are performed according to U.S. EPA methods or other methods deemed satisfactory by the U.S. EPA; and

3. Ensure that any laboratories utilized by the Respondent for analyses participate in a U.S. EPA quality assurance/quality control program equivalent to that which is followed by the U.S. EPA, and which is consistent with U.S. EPA document QAMS-005-80. As part of such a program, and upon request by the U.S. EPA, such laboratories shall perform analyses of samples provided by the U.S. EPA or OEPA to demonstrate the quality of analytical data for each such laboratory.

XVIII. FORCE MAJEURE

A. The Respondent shall cause all work to be performed within the time limits set forth herein, unless performance is

delayed by events which constitute a force majeure. For purposes of this Consent Order, a "force majeure" is an event beyond the control of the Respondent (including delays caused by U.S. EPA, OEPA, U.S. EPA's contractors, or the Agency for Toxic Substances and Disease Registry) which delays performance of any obligations required by this Consent Order. Increases of costs shall not be considered circumstances beyond the control of the Respondent.

B. The Respondent shall notify the U.S. EPA and OEPA in writing no later than two (2) calendar days after the beginning of a delay caused by an event which the Respondent contends is a force majeure. Such notification shall describe the anticipated length of the delay, the cause or causes of the delay, the measures taken and to be taken by the Respondent to minimize the delay, and the timetable by which these measures will be implemented. The Respondent shall have the burden of demonstrating that the event is a force majeure.

C. If the U.S. EPA and OEPA agree that a delay is attributable to a force majeure, the time period for performance under this Consent Order shall be extended for the time period attributable to the event constituting the force majeure.

XIX. STIPULATED PENALTIES

A. Respondent shall be liable for payment into the Hazardous Substances Response Trust Fund administered by the U.S. EPA of the sums set forth below as stipulated penalties for each week or part thereof that the Respondent fails to submit a re-

port or document or comply with a schedule in accordance with the requirements contained in this Consent Order, unless U.S. EPA determines that such delay is attributable to a force majeure as defined in Article XVIII above. Such sums shall be due and payable within fifteen (15) business days of receipt of notification from the U.S. EPA assessing the penalties. These stipulated penalties shall accrue in the amount of $2,500.00 after the fifth business day of any such unexcused delay and $1,000.00 for each business day thereafter. For purposes of this Consent Order and the attached SOW, "business day" shall not include any federal or state holiday.

B. The stipulated penalties set forth in paragraph A of this section shall not preclude the U.S. EPA or OEPA from electing to pursue any other remedy or sanction because of the Respondent's failure to comply with any of the terms of this Consent Order, including a suit to enforce the terms of this Consent Order. Said stipulated penalties shall not preclude the U.S. EPA or OEPA from seeking statutory penalties up to the amount authorized by law in the event of Respondent's failure to comply with any requirements of this Consent Order.

XX. DISPUTE RESOLUTION

A. The parties shall use their best efforts to in good faith resolve all disputes or differences of opinion informally. If, however, disputes arise concerning this Consent Order which the parties are unable to resolve informally or under the procedures set forth in Section X, the Respondent shall present

a written notice of such dispute to the U.S. EPA and OEPA, which shall set forth specific points of dispute, the position of the Respondent and the technical basis therefor, and any actions which the Respondent considers necessary.

B. Within ten (10) business days of receipt of such a written notice, the U.S. EPA and OEPA shall provide a written response to the Respondent setting forth their position and the basis therefor. During the five (5) business days following receipt of the response, the U.S. EPA, OEPA and the Respondent shall attempt to negotiate in good faith a resolution of their differences.

C. Following the expiration of the time periods described in Paragraph B above, if the U.S. EPA and OEPA concur with the position of the Respondent, the Respondent shall be so notified in writing and this Consent Order shall be modified to include any necessary extensions of time or variances of work. If the U.S. EPA and OEPA do not concur with the position of the Respondent, the U.S. EPA and OEPA shall resolve the dispute, based upon and consistent with the terms of this Consent Order, and shall provide written notification of such resolution to the Respondent.

D. The pendency of dispute resolution as set forth in this Article shall not affect the time period for completion of work and/or obligations to be performed under this Consent Order, except that (1) upon mutual agreement of the U.S. EPA, OEPA and

Respondent, any time period may be extended, and (2) in the event U.S. EPA and OEPA do not provide Respondent written notice of resolution of a dispute pursuant to Paragraph C, above, within ten (10) business days of the expiration of the time periods described in Paragraph B, above, the time period for completion of work affected by the dispute shall be extended by the number of business days beyond the ten (10) business days that elapse before Respondent receives written notice of resolution of the dispute from U.S. EPA and OEPA. Elements of work and/or obligations not affected by the dispute shall be completed in accordance with the schedule contained in the Phase I RI Work Plan, the Phase II RI Work Plan and the FS Work Plan.

E. Upon resolution of any dispute, whether informally or using the procedures in this Article, any additions or modifications required as a result of such dispute resolution shall immediately be incorporated into the appropriate plan or procedure and into this Consent Order. The Respondent shall proceed with all remaining work according to the modified plan or procedure.

XXI. COMMUNITY RELATIONS AND PUBLIC COMMENT

A. The Respondent shall cooperate with the U.S. EPA and OEPA in providing RI/FS information to the public. As requested by the U.S. EPA or OEPA, the Respondent shall participate in the preparation of all appropriate information disseminated to the public and in public meetings which may be held or sponsored by the U.S. EPA or OEPA to explain activities at or concerning the Facility, including the findings of the RI/FS.

XXII. RECORD PRESERVATION

The Respondent agrees to preserve, during the pendency of this Consent Order, and for a minimum of ten (10) years after termination of this Consent Order, all records and documents in the possession of the Respondent, or in the possession of any division, employees, agents, accountants, contractors, or attorneys of the Respondent, which relate in any way to actions performed under this Consent Order or to the generation, transport, treatment, storage or disposal of industrial waste, despite any document retention policy to the contrary. Upon reasonable notice by the U.S. EPA or OEPA, the Respondent shall make available to the U.S. EPA or OEPA any such records or copies of any such records unless otherwise privileged under law.

XXIII. CERCLA FUNDING

A. The Respondent waives any claims or demands for compensation or payment under Sections 111 and 112 of CERCLA against the United States or the Hazardous Substance Response Trust Fund established by Section 221 of CERCLA for or arising out of any activity performed or expenses incurred pursuant to this Consent Order.

B. This Consent Order does not constitute any decision on preauthorization of funds under Section 111(a)(2) of CERCLA.

XXIV. RESERVATION OF RIGHTS

A. The U.S. EPA and OEPA reserve all rights and defenses that they may have pursuant to any available legal authority.

B. Nothing herein shall waive the right of the U.S. EPA to enforce this Consent Order, or to take action pursuant to Sections 104, 106(a) and 107 of CERCLA. Nothing herein shall waive the right of OEPA to enforce this Consent Order, or to take action pursuant to CERCLA or applicable State law. The U.S. EPA and OEPA reserve the right to take any enforcement action pursuant to CERCLA and/or any available legal authority, including the right to seek injunctive relief, monetary penalties, and punitive damages. In addition, the U.S. EPA reserves the right to undertake any remedial investigation/feasibility study work, and/or any removal, remedial and/or response actions relating to the Facility, and to seek recovery from the Respondent for any costs incurred in undertaking such actions.

C. Nothing herein is intended to release, discharge, or in any way affect any claims, causes of action or demands in law or equity which the parties may have against any person, firm, partnership or corporation not a party to this Consent Order for any liability it may have arising out of, or relating in any way to, the generation, storage, treatment, handling, transportation, release or disposal of any materials, hazardous substances, hazardous wastes, contaminants, or pollutants at, to, or from the Facility. The parties to this Consent Order expressly reserve all rights, claims, demands, and causes of action they have against any and all other persons and entities who are not parties to this Consent Order, and as to each other for matters not covered hereby.

D. The U.S. EPA and OEPA recognize that the Respondent may have the right to seek contribution, indemnity and/or any other available remedy against any person found to be responsible or liable for contributions, indemnity or otherwise for any amounts which have been or will be expended by the Respondent in connection with the Facility.

E. Nothing herein shall be construed to release the Respondent from any liability for failure of the Respondent to perform the RI/FS in accordance with the Phase I RI Work Plan, the Phase II RI Work Plan and the FS Work Plan attached hereto and incorporated herein. The parties further expressly recognize that this Consent Order and the successful completion and approval of the RI/FS do not represent satisfaction, waiver, release, or covenant not to sue, other than as provided in Section XXX of this Consent Order, of any claim of the United States or the State of Ohio against the Respondent relating to the Facility (including but not limited to claims to require Respondent to undertake further response actions and claims to seek reimbursement of response costs pursuant to Section 107 of CERCLA).

F. Nothing herein is intended to be a release or settlement of any claim for personal injury or property damage by any person not a party to this Consent Order.

XXV. REIMBURSEMENT OF COSTS

A. The U.S. EPA and OEPA shall provide the Respondent

with an accounting of all response costs incurred by the U.S. EPA and OEPA prior to April 1, 1987. Within twenty (20) business days after receipt of such accounting or after the effective date of this Consent Order, whichever occurs later, the Respondent shall pay to the U.S. EPA and OEPA the total sum of their response costs incurred prior to April 1, 1987.

B. At the end of each twelve (12) month period beginning with April 1, 1987, the U.S. EPA and OEPA shall submit an accounting to the Respondent of all oversight costs incurred by the U.S. EPA and OEPA with respect to this Consent Order during the previous twelve (12) month period including, but not limited to, the costs incurred by the U.S. EPA in having a qualified person oversee the conduct of the RI/FS pursuant to Section 104(a) of CERCLA. Within twenty (20) business days of receipt of each such tabulation, the Respondent shall remit a check to the U.S. EPA and to the OEPA for the full amount of their respective costs.

C. Payment to the U.S. EPA for response and oversight costs incurred by the U.S. EPA shall be made to the order of the Hazardous Substance Response Trust Fund and forwarded to the U.S. EPA, Superfund Accounting, P.O. Box 371003M, Pittsburgh, Pennsylvania 15251, Attn: Superfund Collection Office. Written notice of each payment to the U.S. EPA shall be provided at the time of such payments to the U.S. EPA Project Coordinator and to: U.S. EPA, Region V, SWER Branch, Attention: Ms. Isalee Coleman, Office of Regional Counsel, 5CS-16, 230 South Dearborn Street, Chicago,

Illinois 60604.

D. Payment to the OEPA for response and oversight costs incurred by the OEPA shall be payable to "Treasurer, State of Ohio" and forwarded to: Counsel for the Director of the Environmental Protection Agency, 361 East Broad Street, Columbus, Ohio 43215-1049. Written notice of each payment to the State of Ohio shall be provided to the OEPA Project Coordinator at the time of such payment.

E. The U.S. EPA and OEPA reserve the right to bring an action against the Respondent for recovery of any future costs incurred by the United States or the State of Ohio in connection with any response activities conducted or to be conducted at the Facility, other than those response activities completed pursuant to this Consent Order to the satisfaction and approval of the U.S. EPA and OEPA.

XXVI. INDEMNIFICATION

A. The Respondent agrees to indemnify and save and hold the United States Government and the State of Ohio Government, their agencies, departments, agents, and employees, harmless from any and all claims or causes of action arising from, or on account of, acts or omissions of the Respondent, its officers, employees, receivers, trustees, agents, or assigns, in carrying out the activities pursuant to this Consent Order.

B. Neither the U.S. EPA nor OEPA is a party to any contract involving the Respondent at the Facility.

C. Respondent reserves all rights it may have against U.S. EPA pursuant to the Federal Tort Claims Act, 28, U.S.C. §§ 1346, 2671-2680.

D. The Respondent is not a party to any contract involving U.S. EPA or OEPA relating to this Consent Order or any activities at the Facility.

XXVII. CONTINUED OPERATION OF EXISTING GROUNDWATER CONTAINMENT SYSTEM

During the pendency of this Consent Order, Respondent shall continue to operate and maintain its existing groundwater containment system. Respondent's existing groundwater containment system includes three interceptor wells designated on Figure 3 attached to the SOW.

XXVIII. DEED NOTICE, LAND USE AND CONVEYANCE OF TITLE

The Respondent shall assure that no portion of the Facility will be used in any manner which would adversely affect the integrity of any containment or monitoring system installed or maintained pursuant to this Consent Order.

The Respondent shall assure that no conveyance of title, easement or other interest in any portion of the Facility shall be consummated without provision for continued operation and maintenance of any containment or monitoring system installed or maintained pursuant to this Consent Order. The Respondent shall notify U.S. EPA and OEPA by registered mail at least sixty (60) business days prior to any conveyance or of an

intent to convey any interest in land which comprises the Facility and of the provisions made for continued maintenance of the system.

XXIX. NON ADMISSION

A. Nothing in this Consent Order, including the attached SOW or any subsequent attachments incorporated in the Consent Order, is intended to be nor shall be, an admission of facts or law, an estoppel or a waiver of defenses other than as provided in Section I Paragraph B of this Consent Order, by the Respondent for any purpose. Respondent specifically does not admit that the conditions at the Facility involve a release to the environment of any hazardous substance, pollutant or contaminant which presents any risk or threat of risk whatsoever to public health, welfare or the environment. Participation in this Consent Order by the Respondent is not intended by the parties to be, and shall not be, an admission of any fact or opinion developed by any contractor engaged to complete the work specified in this Consent Order or engaged by U.S. EPA OR OEPA to review any such work.

B. Respondent's obligations under this Consent Order are limited to the completion of a RI/FS in accordance with the SOW, the NCP and CERCLA and the continuation of the operation and maintenance of Respondent's existing groundwater containment system pursuant to Sections XXVII and XXVIII of this Consent Order. Nothing in this Consent Order is intended to create nor shall create, any obligation on the part of the Respondent to

undertake any other response action at the facility including without limitation any remedial action.

XXX. COVENANT NOT TO SUE

Upon termination of this Consent Order pursuant to Section XXXIII of this Consent Order, and reimbursement to U.S. EPA and OEPA as provided in Section XXV of this Consent Order, U.S. EPA and OEPA covenant not to sue the Respondent regarding work satisfactorily performed by Respondent pursuant to this Consent Order and for the costs thereof. Nothing herein shall be deemed to grant any rights to persons not a party to this Consent Order, and U.S. EPA and OEPA reserve all rights against any such persons.

XXXI. PUBLIC COMMENT AND EFFECTIVE DATE OF ADMINISTRATIVE ORDER

Within fifteen (15) calendar days of the date of the execution of this Consent Order, the U.S. EPA shall announce the availability of this Consent Order to the public for review and comment. The U.S. EPA shall accept comments from the public for a thirty (30) calendar day period after such announcement. At the end of the comment period, the U.S. EPA and OEPA shall review all such comments and shall either:

a) determine that the Consent Order should be made effective in its present form, in which case the U.S. EPA and OEPA Project Coordinators shall so notify the Respondent in writing, and the Consent

Order shall become effective on the date the Respondent receives such notification; or

b) determine that modification of the Consent Order is necessary, in which case the U.S. EPA and OEPA Project Coordinators will inform the Respondent as to the nature of all required changes. If the Respondent agrees to the modifications, the Consent Order shall be so modified and shall become effective upon signature of the U.S. EPA, subsequent to signature by Respondent, followed by signature by OEPA.

In the event that the Respondent does not agree to modifications required by the U.S. EPA and OEPA as a result of public comment, this Consent Order may be withdrawn by the U.S. EPA and OEPA. In such an event, the U.S. EPA and OEPA reserve all rights to take such actions as they deem necessary.

XXXII. SUBSEQUENT AMENDMENT

In addition to the procedures set forth in Sections XIII, XV, XVIII, and XX of this Consent Order, this Consent Order may be amended by mutual agreement of the U.S. EPA, OEPA and the Respondent. Any amendment of this Consent Order shall be in writing, signed by the U.S. EPA and OEPA, and shall have as the effective date that date on which such amendment is signed by the U.S. EPA.

XXXIII. TERMINATION AND SATISFACTION

A. The provisions of this Consent Order shall be deemed satisfied upon receipt by the Respondent of written notice from the U.S. EPA and OEPA that the Respondent has demonstrated that all of the terms of this Consent Order, including any additional work, modifications or amendments, have been completed in accordance with the terms hereof to the satisfaction of the U.S. EPA and OEPA.

IT IS SO AGREED:
FOR RESPONDENT
ORMET CORPORATION

BY: R. E. Boyle — 3-13-87 Date
R. E. Boyle
President and Chief Executive Officer

IT IS SO ORDERED AND AGREED:

BY: Warren W. Tyler — 3-26-87 Date
Director
Ohio Environmental Protection Agency

BY: Valdas V. Adamkus — 3/27/87 Date
Valdas V. Adamkus
Regional Administrator
U.S. Environmental Protection Agency, Region V

Ormet Corporation Site, Hannibal, Ohio
Remedial Investigation and Feasibility Study
Statement of Work

I. DEFINITIONS

A. "U.S. EPA" shall mean the United States Environmental Protection Agency, Region V.

B. "OEPA" shall mean the Ohio Environmental Protection Agency,

C. "Respondent" shall mean Ormet Corporation.

D. "Facility" shall mean the area located between the west bank of the Ohio River and Ohio State Route # 7, near Hannibal, Ohio, on the northeastern half of a lens-shaped stretch of land approximately 2.5 miles long and about .5 miles wide, at its widest point.

II. PURPOSE

The purpose of this Statement of Work is to: (1) conduct a remedial investigation (RI) to determine the nature and extent of the release or threatened release of hazardous substances, pollutants or contaminants from the Facility; and (2) to perform a feasibility study (FS) to identify and evaluate alternatives for the appropriate extent of remedial action, if any, to prevent or mitigate the migration of any release or threatened release from the Facility of hazardous substances, or of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare. The Respondent shall furnish all material, personnel and services necessary for performing the RI/FS at the Facility. The Respondent shall follow all U.S. EPA guidance not inconsistent with the National Contingency Plan (NCP), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499 (CERCLA) in performing this work.

III. OBJECTIVES

The objectives of the Remedial Investigation (RI) recommended for the Facility are:

- Determine if groundwater or surface water contamination has occurred on site and/or off site and the quality, concentration, and direction of contamination flow.

- Identify any contaminated soil and/or sediment that may be present on or adjacent to the Facility.

- Identify specific contaminants which have been found to pose acute or chronic hazards to the public health, welfare, or the environment.

- Identify existing or potential pathways, and receptors, if any, of contaminant migration from the Facility, if any, which affect or may pose a threat to the public health, welfare, or the environment.

- Quantify risk, if any, to public health and the environment.

The objectives of the Feasibility Study (FS) recommended for the Facility are:

- Characterize problems and identify general response actions for the protection of public health, welfare and the environment.

- Identify technologies and develop alternatives for remedial actions.

- Screen technologies and alternatives by utilizing technical, environmental, public health, and cost factors with a list of identified alternative remedial actions being the final output.

- Generate a summary of alternatives for the Final Feasibility Study Report by performing a detailed analysis utilizing technical, cost, institutional, public health, and environmental factors.

IV. SCOPE OF WORK

The Remedial Investigation and Feasibility Study shall consist of twelve tasks:

Task 1 - Description of Current Situation
Task 2 - Phase I Work Plan
Task 3 - Phase I Site Investigation
Task 4 - Phase II Work Plan
Task 5 - Phase II Site Investigation
Task 6 - Remedial Investigation Report
Task 7 - Feasibility Study Work Plan
Task 8 - Preliminary Remedial Technologies Identification
Task 9 - Development of Alternatives
Task 10 - Initial Screening of Alternatives
Task 11 - Evaluation of Alternatives
Task 12 - Feasibility Study Report

TASK 1 - DESCRIPTION OF CURRENT SITUATION

The Respondent shall describe the background information pertinent to the Facility and its problems and outline the purpose for remedial investigation at the Facility. The data gathered during any previous investigations or inspections and other relevant data should be used.

This task should be conducted concurrently with Task 2, Phase I Work Plan and included as the Introduction Section of the Work Plan.

A. Site Description

The Respondent shall define the total area of the Facility and the general nature of the problem, including all pertinent history relative to the use of areas on the Facility for waste storage or disposal.

The Respondent shall prepare summaries of the regional location, pertinent area boundary features, and site physiography, hydrology, geology, hydrogeology, and ecology.

B. Nature and Extent of Problem

The Respondent shall prepare a summary of any actual and potential on-site and off-site health and environmental effects. This may include, but is not limited to: the types, physical states, and amounts of the wastes on the Facility, focusing on both organic and inorganic contaminants; the existence and conditions of lagoons and disposal areas; potential biologic and sediments contamination in the Ohio River; contaminated releases such as leachate or runoff; socioeconomics; affected media and pathways of exposure; and any potential human exposure. Emphasis should be placed on describing any threat or potential threat to public and the environment.

C. History of Response Actions

The Respondent shall prepare a summary of any previous response actions conducted by either local, State, Federal, or private parties, including any site inspections and other technical reports, and their results. This summary should address any enforcement activities undertaken to compel private cleanup. A list of reference documents and their location shall be included. The scope of the RI should be developed to address the problems and questions that have been identified through previous work at the Facility.

D. Facility Inspection

The Consultant hired by the Respondent should conduct an initial site visit to become familiar with the topography, access routes, and proximity of receptors to possible contamination and to collect data for preparation of the site health and safety plan. The visit shall be used to verify any site information developed in this task.

E. Define Boundary Conditions

The Respondent shall establish site boundary conditions to limit the areas of site investigations. The boundary conditions may be used to identify boundaries for site access control and site security. [If not in existence, installation of a fence or other security measures should be considered.]

F. Site Map

The Respondent shall prepare a detailed site topographic map (using 5-foot

contour intervals) showing all wetlands, floodplains, water features, drainage patterns, tanks, buildings, utilities, paved areas, easements, rights-of-ways, and other features. The site map and all topographical surveys should be of sufficient detail and and accuracy to locate and report all existing and future work performed at the site. [Permanent baseline monuments, bench marks, and/or a reference grid tied into any existing reference system (i.e., State or USGS) should be considered as an option.]

G. Additional Data

The Respondent shall search, collect, and compile any additional site information. Additional maps, historical photographs, soils, groundwater, surface water, and meteorological (wind rose) data and reports shall be collected. Sources of additional information include the Ohio Geological Survey, Soil Conservation Service (SCS), local health department, and local well drillers.

TASK 2 - PHASE I WORK PLAN

The Respondent shall review this Statement of Work in its entirety and then prepare a detailed Phase I Work Plan. The Work Plan shall include a detailed technical approach, personnel requirements, schedule for the proposed Phase I activities and shall be prepared in accordance with the U.S. EPA document EPA/540/G-85/002, "Guidance on Remedial Investigations under CERCLA" or any additional guidance documents provided by U.S. EPA which are not inconsistent with the NCP. The draft Work Plan shall be submitted to the United States Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (OEPA) for review and approval in accordance with the procedures set forth in the Consent Order.

In addition to the activities outlined in Tasks 1 and 3, development of the Work Plan shall include:

A. Quality Assurance Project Plan

Prior to submittal of the Quality Assurance Project Plan (QAPP), the Respondent shall notify the U.S. EPA of the laboratory it intends to utilize for sample analysis. The U.S. EPA Quality Assurance Office will determine if the laboratory is capable of performing the analyses, possibly through performance evaluation sample results and/or a laboratory inspection. The U.S. EPA reserves the right to refuse usage of a laboratory deemed incapable of performing the necessary analyses.

After laboratory approval is obtained, the Respondent shall prepare a site specific QAPP that conforms to the specifications in the "User's Guide to the U.S. EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Plans" (QAMS-005/80) and Region V's "Guidance for Preparation of Quality Assurance Project Plans". The draft plan shall be submitted to U.S. EPA and OEPA for review and approval prior to initial sample collection. Incorporation of review comments into the QAPP and final U.S. EPA approval shall be necessary prior to initiating sampling. A minimum period of 45 days will be necessary for QAPP approval.

The plan shall, at a minimum, include:

- Project organization and data management
- Sampling objectives
- Sampling protocol and equipment
- Sample chain of custody
- Field equipment calibration/maintenance
- Decontamination procedures
- Quality control procedures (field sample duplicates and blanks)
- Quality assurance audits
- Nonconformance/corrective action
- Site specific sampling plan
- Methods of analysis (laboratory procedures)
- Numerical calculations and peer review

B. Site Health and Safety Plan

The Respondent shall prepare a plan designed to protect the health and safety of personnel involved in the RI. The plan must also address health and safety procedures for site visitors and local residents. The plan must be consistent with:

- Section 111(c)(6) of CERCLA
- U.S. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities
- U.S. EPA Order 1440.3 -- Respiratory Protection
- U.S. EPA Occupation Health and Safety Manual
- U.S. EPA Interim Standard Operating Safety Procedures (September, 1982)
- Site conditions

C. ATSDR Health Assessment

The work plan for the site shall also provide for collection of

adequate information to support an Agency for Toxic Substances and Disease Registry (ATSDR) health assessment which is required by the Superfund Amendments and Reauthorization Act of 1986 (SARA). In order to insure that ATSDR needs are fulfilled, all draft work plans will be submitted by U.S. EPA to ATSDR for review and comment.

D. Endangerment Assessment

The work plan for the site shall also provide for collection of adequate information to support an Endangerment Assessment performed by U.S. EPA.

TASK 3 - PHASE I SITE INVESTIGATION

The objectives of the Phase I investigation are to identify the specific contaminants and locations of concern. The Respondent shall perform the work outlined below as part of this task. Parameter identification shall be accomplished by following U.S. EPA approved Contract Laboratory Program procedures.

A. Disposal Pond Waste Characterization

Sludge samples shall be collected (as schematically illustrated on Figure 1) and analyzed from each of the five disposal ponds. In addition, natural soils adjacent to the disposal ponds shall be physically characterized as follows:

1. Disposal Pond 1 and 2 - Both Ponds 1 and 2 shall be divided into a northern half and a southern half. Samples of the sludge shall be collected from two (2) boring locations in each pond half.

   The sampling program shall characterize three (3) horizontal sampling planes within the sludge body in each of these ponds. Four sludge samples shall be collected from each boring. Collection of the sludge samples shall occur at three (3) routine discrete depth intervals in each boring with the lowermost sample collected at the sludge/soil interface, except that where the sampling interval occasionally occurs below the sludge/soil interface, that sample shall be eliminated. The uppermost sample shall be collected in the solid layer of sludge at the pond surface. Sludge samples from similar depths in each pond will be composited for analysis. To accomodate differing depths in each pond, samples from the sludge/soil interface shall be composited regardless of sampling depth.

   One (1) double-ring infiltrometer test shall be performed in each pond to assess sludge permeability.

   To assess the physical characteristics of the soil beneath each

disposal pond, perimeter soil borings shall be performed. Each boring shall extend to a depth of five (5) feet below the pond bottom or until naturally occurring sand and gravel is encountered, which ever is greater. Two borings shall be performed per pond. The visible physical characteristics of the soil shall be logged and reported.

2. Disposal Pond 3 - Samples of the sludge shall be collected from four (4) boring locations in the pond.

   The sampling program shall characterize three (3) horizontal sampling planes within the sludge body in the pond. Four s sludge samples shall be collected form each boring. Collection of the sludge samples shall occur at three (3) routine discrete depth intervals in each boring with the lowermost sample collected at the sludge/soil interface, except that where the sampling interval occasionally occurs below the sludge/soil interface, that sample shall be eliminated. The uppermost sample shall be collected in the solid layer of sludge at the pond surface. Sludge samples from similar depths in the pond shall be composited for analysis. To accomodate differing depths in each pond, samples from the sludge/ soil interface shall be composited regardless of sampling depth.

   One (1) double-ring infiltrometer test shall be performed in the pond to assess sludge permeability.

   To assess the physical characteristics of the soil beneath the disposal pond, perimeter soil borings shall he performed. Each boring shall extend to a depth of five (5) feet below the pond bottom or until naturally occurring sand and gravel is encountered, which ever is greater. Two borings shall be performed. The visible physical characteristics of the soil shall be logged and reported.

3. Disposal Pond 4 - Disposal Pond 4 shall be divided into two (2) sections, a northwest section and a southeast section. Samples of the sludge shall be collected from four (4) boring locations in each pond section.

   The sampling program shall characterize three (3) horizontal sampling planes within the sludge body in the pond. Four sludge samples shall be collected from each boring. Collection of the sludge samples shall occur at three (3) routine discrete depth intervals in each boring with the lowermost sample collected at the sludge/ soil interface, except that where the sampling interval occasionally occurs below the sludge/soil interface, that sample shall be eliminated. The uppermost sample shall be collected in the solid layer of sludge at the pond surface. Sludge samples from similar depths in each pond section shall be composited for analysis. To accomodate differing depths in each pond, samples from the sludge/ soil interface shall be composited regardless of sampling depth.

One (1) double-ring infiltrometer test shall be performed in each pond section to assess sludge permeability.

To assess the physical characteristics of the soil beneath the disposal pond, perimeter soil borings shall be performed. Each boring shall extend to a depth of five (5) feet below the pond bottom or until naturally occurring sand and gravel is encountered, which ever is greater. Four (4) borings shall be performed. The visible physical characteristics of the soil shall be logged and reported.

4. Disposal Pond 5 - Disposal Pond 5 shall be divided into five sections. There shall be one (1) section corresponding to each of the four (4) historical discharge lines to the pond, thus resulting in four (4) sections. The fifth section shall correspond to that area remaining in the pond that was relatively unaffected by the four (4) historical discharge lines. In the fifth section only, at a minimum, four (4) boring locations shall be sampled. Samples of the sludge shall be collected from four (4) boring locations in each of the other four (4) pond sections.

   The sampling program shall characterize four (4) horizontal sampling planes within the sludge body in the pond. Five (5) sludge samples shall be collected from each boring. Collection of the sludge samples shall occur at four (4) routine discrete depth intervals in each boring with the lowermost sample collected at the sludge/soil interface, except that where the sampling interval occasionally occurs below the sludge soil interface, that sample shall be eliminated. The uppermost sample shall be collected in the solid layer of sludge at the pond surface. Sludge samples from similar depths in each pond section shall be composited for analysis. To accomodate differing depths in the pond, samples from the sludge/ soil interface shall be composited regardless of sampling depth.

   One (1) double-ring infiltrometer test shall be performed in each pond section to assess sludge permeability.

   To assess the physical characteristics of the soil beneath the disposal pond, perimeter soil borings shall be performed. Each boring shall extend to a depth of five (5) feet below the pond bottom or until naturally occurring sand and gravel is encountered, which ever is greater. Ten (10) borings shall be performed. The visible physical characteristics of the soil shall be logged and reported.

5. Sludge Analysis for all Ponds - All samples collected shall be analyzed for the following parameters:

   1. pH - laboratory
   2. Ammonia-nitrogen

3. Fluoride
4. Silica (as SiO_2)
5. Cyanide (total)
6. Cyanide (Amenable to Chlorination)
7. Solids (% by weight)
8. Total Organic Carbon
9. Alkalinity
10. Chloride
11. Sulfate
12. Organic and inorganic parameters outlined in the U.S. EPA CLP list including Polychlorinated Biphenyls (PCBs) and excluding both pesticides and 2,3,7,8 dioxin.

B. Waste Potliner Storage Area Characterization

The waste potliner storage area shall be gridded off into two hundred (200)-foot by two hundred (200)-foot sections, as shown in Figure 2. A boring shall be drilled to a depth of ten (10) feet in the center of each section. Each boring shall be sampled and composited over the following depth ranges: zero (0) feet to two (2) feet, two (2) feet to four (4) feet, four (4) feet to six (6) feet, six (6) feet to eight (8) feet, and eight (8) feet to ten (10) feet. Each composite shall be analyzed for the following: calcium, sodium, fluoride, ammonia - nitrogen, pH, and total cyanide.

Based upon the results of the initial inorganic analyses, all depth composites from borings in four (4) sections shall be analyzed for the organic and inorganic parameters outlined in the U.S. EPA CLP List including PCBs and excluding both pesticides and 2,3,7,8 dioxin.

Depending on the variability of the analytical results of the boring composites from the four (4) sections, all depth composites from borings in an additional four (4) sections may be selected for analysis for the same parameters as the previous four (4) sections.

C. Construction Material Scrap Dump Characterization

The two (2) seeps located at the base of the construction material scrap dump and identified during the November 20, 1986, site visit by U.S. EPA and OEPA, shall be sampled. All samples shall be analyzed for the following parameters:

1. pH - field and laboratory
2. Specific conductance - field and laboratory
3. Ammonia - nitrogen
4. Fluoride
5. Total Dissolved Solids
6. Total Organic Carbon
7. Alkalinity

8. Chloride
9. Sulfate
10. Silica (Dissolved)
11. Cyanide (total)
12. Cyanide (Amenable to Chlorination)
13. Organic and inorganic parameters outlined in the U.S. EPA CLP list excluding PCBs, pesticides, and 2,3,7,8 dioxin.

D. Ohio River Sediments Characterization

All past and present discharge areas shall be identified. One river sediment sample shall be taken from each of the six (6) sampling locations identified, as shown in Figure 3. This includes an upstream sample to determine background conditions and a sample in the backwater area of outfall 004.

Whole samples (sediment and interstitial water) shall be analyzed for the following parameters:

1. pH - laboratory
2. Ammonia - nitrogen
3. Fluoride
4. Total Organic Carbon
5. Alkalinity
6. Chloride
7. Sulfate
8. Silica (as SiO_2)
9. Cyanide (total)
10. Cyanide (Amenable to Chlorination)
11. Organic and inorganic parameters outlined in the U.S. EPA CLP list including PCBs (if found to be present in disposal pond solids or in waste potliner storage areas), but excluding pesticides, and 2,3,7,8 dioxin.

E. Monitoring Well Installation

Additional monitoring wells shall be installed at the following approximate locations prior to the next round of groundwater sampling:

1. Along the western side of the construction material scrap dump at a point approximately two hundred (200) feet south of MW 12.

2. Immediately west of disposal pond 3.

3. In the area of well TH3 approximately one hundred (100) to two hundred (200) feet southeast of TH3.

F. Groundwater Sampling

All monitoring wells shall be sampled and analyzed for:

1. pH - field and laboratory
2. Specific conductance - field and laboratory
3. Ammonia - nitrogen
4. Total Dissolved Solids
5. Total Organic Carbon
6. Alkalinity
7. Chloride
8. Fluoride
9. Sulfate
10. Sodium
11. Potassium
12. Calcium
13. Magnesium
14. Iron (total)
15. Manganese
16. Zinc
17. Copper
18. Nickel
19. Cobalt
20. Chromium (total)
21. Lead
22. Cadmium
23. Barium
24. Aluminum
25. Silica (Dissolved)
26. Cyanide (total)
27. Cyanide (Amenable to Chlorination)
28. Selenium
29. Arsenic

The following monitoring wells shall be sampled and analyzed for the organic parameters outlined on the U.S. EPA CLP list and any additional inorganic parameters on the U.S. EPA CLP list that are not listed above:

1. 2,5,8,11,12,13,14,15,16,17,18,19,28,29s,29d,30,31,32,33s,33d,34s,34d, 35,36,37,39s,39d,40s,40d;

2. The three (3) new wells outlined in Section E. above.

G. Carbon Runoff and Deposition Area

A portion of the plant site located directly west of the construction material scrap dump (the wooded area) has at least three distinct areas of carbon sludge deposition that were identified by U.S. EPA and OEPA during a November 20, 1986, site visit. Two samples of both the carbon sludge and the soil beneath each deposit shall be

taken. The whole samples shall be analyzed for the following parameters:

1. pH - laboratory
2. Total Organic Carbon
3. Alkalinity
4. Chloride
5. Fluoride
6. Sulfate
7. Silica (as SiO_2)
8. Cyanide (total)
9. Cyanide (Amenable to Chlorination)
10. Organic and inorganic parameters in the U.S. EPA CLP list excluding PCBs, pesticides, and 2,3,7,8, dioxin.

The entire wooded area of the plant site bounded on the west by the toe of the hill below the plant fence line (between wells MW3 and MW40), on the east by the outfall 004 stream, on the north by the fence line south of Disposal Ponds 1 and 2, and on the south by the Ohio River, shall be gridded off into fifty (50)-foot by fifty (50)-foot sections. Hand borings shall be performed at each grid line intersection to assess both the areal extent and depth distribution of all sludge deposits.

H. Air Monitoring

The potential for contaminant releases from the site to the atmosphere shall be evaluated by sampling in the following areas:

1. directly downwind of the disposal ponds, a suspected source;

2. directly downwind of the former potliner storage areas, a suspected source;

3. upwind of both suspected source areas for a background sample.

The sampler shall be a high-volume type sampler. The samples shall be 24-hour samples. The samples shall be collected from each sampler once every six (6) days for ten (10) months for a total of fifty (50) samples per sampler. The samples shall be analyzed for amount of respirable dust per unit volume air by a qualified independent laboratory.

I. Disposal Pond 5 Conduit

The corrugated steel conduit at the river edge of Disposal Pond 5, if water is flowing from it at the time of sampling, shall be sampled. The sample shall be analyzed as outlined in Section C Construction Material Scrap Dump Characterization.

J. Plant Recreation Area Waste Investigation

The two (2) seeps located at the base of the slope leading to the baseball field and identified by U.S. EPA and OEPA during a November 20, 1986, site visit shall be sampled. All samples shall be analyzed as outlined in Section C Construction Material Scrap Dump Characterization.

One (1) soil boring shall be performed in the horseshoe area. This boring shall extend to a depth of five (5) feet into naturally occurring soils. The entire depth of the boring shall be continuously sampled and the physical characteristics of soils and any waste materials encountered shall be logged and reported.

Two (2) soil borings shall be performed near the baseball diamond area. These borings shall be in a line roughly parallel to the Ohio River. The borings shall extend to a depth of five (5) feet into naturally occurring soils. The entire depth of the borings shall be continuously sampled and the physical characteristics of soils and any waste material encountered shall be logged and reported.

K. Sample Analysis

All sampling and analysis must conform to guidelines outlined in the Users Guide to the U.S. EPA Contract Laboratory Program, 1982.

TASK 4 - PHASE II WORK PLAN

The Respondent shall review and evaluate data obtained during Phase I activities to determine if the objectives of Phase I have been satisfied and to identify additional field activities necessary to fulfill the overall objective of the RI. The Respondent, the Consultant and their staff shall explain the results of the evaluation to U.S. EPA and OEPA. U.S. EPA and OEPA shall determine whether further activities are required. The objective of Phase II will be to gather the additional data necessary to determine the nature and extent of contamination, to support an endangerment assessment and evaluate potential remedial alternatives for a final remedy. As part of this effort, the Respondent shall also submit a preliminary list of general response actions for each operable unit, i.e., soil, groundwater, surface water, air and sediment.

The Phase II Work Plan shall include:

° Evaluation of Phase I activities.

° The technical approach and schedule for the proposed Phase II activities. The technical approach shall be drafted such that the objectives outlined in Task 5 will be met.

° Additionally, based on the results of Phase I it may be necessary to revise the original Quality Assurance Project Plan (QAPP) and the Health

and Safety Plan (HASP). The Phase II QAPP and HASP must be drafted and submitted in compliance with the same criteria oulined in Task 2 of this Statement of Work.

The draft Phase II Work Plan shall be submitted to the U.S. EPA and OEPA for review and approval in accordance with the procedures set forth in the Consent Order.

TASK 5 - PHASE II SITE INVESTIGATION

A. Field Activities

The Respondent shall upgrade all Phase I activities as necessary to meet the overall objective of the RI by:

- Delineating the horizontal and vertical extent of any groundwater contamination that may exist across the site.
- Delineating the horizontal and vertical extent of any off-site groundwater contaminant plume that may exist.
- Providing additional hydrogeological data needed to guide potential remedial actions.
- Initiating a groundwater monitoring network to detect future movement of contaminants and to assess results of potential remedial actions.
- Providing additional ground water, surface water, sediment, or soil data needed to guide potential remedial actions.
- Performing additional sampling activities including those outlined in paragraph C below.

This may include:

- Installation and sampling of additional monitoring wells.
- Repeating or upgrading the Phase I sampling plan.
- Additional soil sampling to include surface and subsurface layers.

B. Sample Analysis

All sampling and testing must conform to guidelines outlined in the Users Guide to the U.S. EPA Contract Laboratory Program prepared by the Sample Management Office of CLP and published in 1982. All samples may be analyzed for the same parameters as in Phase I or the parameters may

be revised based on results of Phase I sampling if concurrence from U.S. EPA and OEPA is obtained.

C. Groundwater Sampling and Analysis

Six (6) monitoring wells shall be sampled and analyzed for polynuclear aromatic hydrocarbons (PAH) on the U.S. EPA CLP List. The PAH analysis shall be accomplished using a detection limit in the low parts per trillion level of approximately five (5) parts per trillion (ppt) by the laboratory selected by the Respondent with U.S. EPA and OEPA approval.

Only one of the six wells shall be an upgradient well. All six wells shall be selected from those wells analyzed for CLP organic parameters as outlined in the Phase I Activity of Task 3F. The selection of the six wells to be analyzed for PAHs shall be based on results of the Phase I analysis of CLP organic parameters and shall require U.S. EPA and OEPA concurrence. Additional sampling of site monitoring wells for those parameters listed under Task 3F may be necessary based on results of Phase I and II analyses.

D. Additional RI Activities

Upon completion of Sections A, B, and C of Task 5 of the Statement of Work the Respondent will, in consultation with U.S. EPA and OEPA, review the gathered data with respect to its ability to support an endangerment assessment and the FS. If the data is found to be insufficient by U.S. EPA and OEPA, the Respondent shall prepare a brief Work Plan Addendum for obtaining the necessary data. Review, approval and sample analysis will follow the format outlined in Tasks 4 and 5 above.

E. Laboratory and Bench Scale Studies

The Respondent shall, as necessary, conduct laboratory and/or bench-scale studies to determine the applicability of remedial technologies to site conditions and problems. The Respondent shall analyze the technologies, based on literature review, vendor contacts, and past experience to determine the testing requirements.

The Respondent shall develop a testing plan as part of the Phase II RI Work Plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and data management and interpretation guidelines. This testing plan shall be submitted to U.S. EPA and OEPA for review and approval.

Upon completion of the testing, the Respondent shall evaluate the testing results to assess the technologies with respect to the site-specific questions identified in the test plan. The Respondent shall scale up those technologies selected based on testing results.

The Respondent shall summarize the testing program and its results in the RI Report.

TASK 6 - REMEDIAL INVESTIGATION REPORT

The Respondent shall prepare a thorough analysis and summary of all remedial investigations and their results. This report shall be prepared in accordance with the procedures set forth in the Consent Order. This report shall be prepared in accordance with the U.S. EPA document entitled "Guidance on Remedial Investigations under CERCLA" (EPA/540/G-85/002) and any additional guidance documents provided by U.S EPA which shall not be inconsistent with the NCP.

A. Prepare Draft Remedial Investigation Report

The Respondent shall prepare the draft RI report utilizing all data collected during the Remedial Investigation. The results and data shall be organized and presented logically so that the relationship between site investigations for each media are apparent. The report shall include a list of potential general response actions that should be evaluated in the Feasibility Study. The no action alternative shall be included as a baseline.

B. Draft Report Review Meeting

The Respondent and his necessary staff shall be prepared to discuss the draft report with U.S. EPA and OEPA. Prior to these discussions, the Agencies will have provided the Respondent with their specific review comments on the draft report.

C. Prepare Final Remedial Investigation Report

The Respondent shall prepare the final report based on the U.S. EPA's and OEPA's review comments. A public meeting may be held to present the conclusions of the Remedial Investigation. If requested, the Respondent and Consultant shall be present to answer any technical questions.

TASK 7 - FEASIBILITY STUDY WORK PLAN

Concurrent with submittal of the draft RI Report, the Respondent shall submit a detailed Work Plan for the Feasibility Study (FS) that is consistent with Tasks 8 through 12 of this Statement of Work. The Work Plan must also be consistent with U.S. EPA document (EPA/540/G-85/003), "Guidance on Feasibility Studies under CERCLA" as amended and any additional guidance documents provided by U.S EPA which shall not be inconsistent with the NCP. The Work Plan shall include the technical approach and schedule for the proposed Feasibility Study activities. The draft Work Plan shall be submitted to U.S. EPA and OEPA for review and approval in accordance with the schedule set forth in the Consent Order. After the Agencies have completed their review, the Respondent, the Consultant, and their appropriate staff may meet with U.S. EPA and OEPA to discuss the draft document and any modifications that may be necessary. The revised Work Plan must be approved by U.S. EPA and OEPA prior to initiating any tasks.

TASK 8 - PRELIMINARY REMEDIAL TECHNOLOGIES IDENTIFICATION

Based on the site-specific problems identified in the RI and the Endangerment Assessment, the Respondent shall develop a master list of potentially feasible technologies in accordance with U.S. EPA document entitled "Guidance on Feasibility Studies under CERCLA" (EPA/540/G-85/003) and the National Contingency Plan. These technologies shall include both on-site and off-site remedies, depending on site problems. The master list shall be screened based on site conditions, waste characteristics, a literature search, and technical requirements, to eliminate or modify those technologies that may prove extremely difficult to implement, will require unreasonable time periods, or will rely on insufficiently developed technology. All criteria considered and technologies eliminated should be thoroughly documented.

All technologies shall be assessed on the basis of acceptable engineering practices. The specific factors to be evaluated include:

° Reliability

° Established technology

° Suitability to control the problem

° Health and safety risks to construction and operational personnel

° Constructability and operability within site conditions

° Maintainability and sensitivity to offsite concerns

° Offsite transportation and disposal requirements

A draft Technology Assessment Chapter of the Feasibility Study Report shall be prepared to both document the results of the literature search and technology assessment and present the conclusions regarding the applicability of various technologies. The draft chapter shall be submitted to U.S. EPA and OEPA for review in accordance with the procedures set forth in the Consent Order.

TASK 9 - DEVELOPMENT OF ALTERNATIVES

Based on established response objectives, the results of the RI, the Endangerment Assessment, and consideration of preliminary remedial technologies(Task 8), the Respondent shall develop a limited number of alternatives for source control or off-site remedial actions, or both.

A. Establishment of Remedial Response Objectives

The Respondent shall establish site-specific objectives for the response. These objectives will be based on public health and environmental concerns, results of the Remedial Investigation, the Endangerment Assessment, Section 300.68 of the National Contingency Plan (NCP), U.S. EPA interim guidance, and requirements of any other applicable U.S. EPA, Federal, and State environmental standards, guidance, and advisories as defined under U.S. EPA's CERCLA compliance policy and shall not be inconsistent with the NCP. Objectives for source control shall be developed to prevent or significantly minimize migration of contamination from the site.

Objectives for management of migration shall be developed to eliminate or minimize impacts of contamination that has migrated or may migrate in the future from the site. Preliminary cleanup objectives shall be developed in consultation with U.S. EPA and OEPA and shall be subject to their comment and modification. The Respondent shall provide a list of the preliminary cleanup objectives to U.S. EPA and OEPA for their approval.

B. Identification of Remedial Alternatives

The Respondent shall develop alternatives that incorporate remedial technologies (from Task 8), response objectives, and other appropriate considerations into a comprehensive, site-specific approach. Alternatives developed shall include the following (as appropriate):

- Alternatives for off-site treatment or disposal.
- Alternatives which attain applicable and/or relevant public health or environmental standards.
- Alternatives which exceed applicable and/or relevant public health or environmental standards.
- Alternatives which do not attain applicable and/or relevant public health or environmental standards, but will reduce the likelihood of present or future threat from the hazardous substances present on site. This must include an alternative which closely approaches the level of protection provided by the applicable or relevant standards.
- No action.

There may be overlap among the alternatives developed. Further, alternatives outside of these categories may also be developed, such as noncleanup alternatives (e.g., alternative water supply, relocation, etc.). The alternatives shall be developed in close consultation with U.S. EPA and OEPA and subject to their concurrence. The Respondent shall document the rationale for excluding any technologies identified in Task 8 in the development of alternatives.

TASK 10 - INITIAL SCREENING OF ALTERNATIVES

The alternatives developed in Task 9 will be screened by the Respondent to eliminate those that are clearly infeasible or inappropriate prior to undertaking detailed evaluations of the remaining alternatives. All criteria considered and alternatives eliminated should be thoroughly documented in the FS report.

A. Considerations to be Used in Initial Screening

Three broad considerations must be used as a basis for the initial screening: public health, the environment and cost. More specifically, the following factors must be considered:

1. Environmental Protection - Only those alternatives that satisfy the response objectives and contribute substantially to the protection of public health, welfare, or the environment will be considered further. Source control alternatives will achieve adequate control of source materials. Management of migration alternatives will minimize or mitigate the threat of harm to public health, welfare, or the environment.

2. Environmental Effects - Alternatives posing significant adverse environmental effects will be excluded. The adverse impacts of the alternatives, the adequacy of source control, and the acceptable mitigation of danger to public health and welfare and the environment shall be identified.

3. Technical Feasibility - Technologies that may prove extremely difficult to implement, will not achieve the remedial objectives in a reasonable time period, or will rely upon unproven technology should be modified or eliminated. The alternative must be technically feasible regarding site location and conditions. It also must be applicable to the project needs, and must be a reliable method of solving the identified problem.

4. Cost - An alternative whose cost far exceeds that of other alternatives will usually be eliminated unless other significant benefits may also be realized. Total costs will include the cost of implementing the alternatives and the cost of operation and maintenance.

TASK 11 - EVALUATION OF ALTERNATIVES

The Respondent shall evaluate the effectiveness of alternative remedies that pass through the initial screening in Task 10. Alternatives that use treatment technologies that permanently and significantly reduce the volume, toxicity, or mobility of contaminants are preferred over other alternatives. When treatment technologies are practicable and available, offsite disposal without treatment is the least favored alternative. The selected alternative must be protective of human health and the environment. It must use permanent solutions and alternative technology or resource recovery to the maximum extent practicable. If a remedial alternative will leave contamination on site, U.S. EPA must review the site at least every five years to determine if additional response is needed. A list of these sites must be prepared by U.S. EPA and reported to Congress. Technologies need not be demonstrated at sites with similar characteristics. Alternative evaluation will be preceded by detailed development of the remaining alternatives, as follows:

A. Technical Analysis
Technical Analysis of alternatives shall, at a minimum:

1. Describe appropriate treatment, storage, and disposal technologies.

2. Discuss how the alternative does (or does not) comply with specific

requirements of other environmental programs. When an alternative does not comply, discuss how the alternative prevents or minimizes the migration of wastes. Also, discuss the public health and environmental impacts and describe special design needs that could be implemented to achieve compliance.

The alternative must attain a level of control required by legally applicable or relevant and appropriate requirements (ARARs)with respect to the specific site, per Section 121 of CERCLA. Both Federal and State standards, requirements, criteria, or limitations are included. Federal standards include the following laws: Toxic Substances Control Act; Safe Drinking Water Act; Clean Air Act; Clean Water Act; Marine Protection, Research and Sanctuaries Act; Solid Waste Disposal Act.

3. Outline operation, maintenance, and monitoring requirements of the remedy.

4. Identify and review potential off-site disposal facilities to ensure compliance with applicable RCRA and other EPA environmental program requirements, both current and proposed. Potential disposal facilities should be evaluated to determine whether off-site management of site wastes could produce a potential for a future release from the disposal facility.

5. Identify temporary storage requirements, off-site disposal needs, and transportation plans.

6. Describe whether the alternative results in permanent treatment or destruction of the wastes, and, if not, the potential for future release to the environment.

7. Outline safety requirements for remedial implementation (including both on-site and off-site health and safety considerations).

8. Describe how the alternative could be phased into individual operable units. The description should include a discussion of how various operable units of the total remedy could be implemented individually or in groups, resulting in a significant improvement to the environment or savings in cost.

9. Describe how the alternative could be segmented into areas to allow implementation in differing phases.

10. Describe any special engineering requirements or site preparation considerations.

B. Environmental Analysis

The Respondents shall perform an Environmental Assessment of each alternative. The Environmental Assessment shall focus on the site

problems and pathways of contaminant movement specifically addressed by the alternative. The Environmental Assessment for each alternative shall include, at a minimum, an evaluation of beneficial and adverse effects of the alternative, an analysis of measures to mitigate adverse effects, an assessment for adequacy of proposed source control measures, an evaluation of the effectiveness of offsite control measures, and an outline of institutional and legal constraints. The no-action alternative shall be fully evaluated to describe the current site situation and anticipated environmental conditions if no actions are taken. The no-action alternative shall serve as the baseline for the analysis.

C. Public Health Analysis

Each alternative shall be assessed in terms of the extent to which it mitigates long-term exposure to any residual contamination and protects public health both during and after completion of the remedial action. The assessment shall describe the levels of contaminants on-site, potential exposure routes, and all potentially affected populations. The public health impacts of "no action" shall be described both in terms of short-term effects (e.g., lagoon failure) and long-term effects resulting from continued exposure to hazardous substances. Each remedial alternative will be evaluated to determine the level of exposure to contaminants and the resulting reduction in contaminant levels with time. The relative reduction in public health impacts for each alternative shall be compared to the no-action level. For management of migration measures, the relative reduction in impact shall be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to U.S. EPA and OEPA. For source control measures or when criteria, standards, or guidelines are not available, the comparison should be based on the relative effectiveness of technologies. The no-action alternative will serve as the baseline for the analysis.

D. Institutional Analysis

Each alternative will be evaluated based on relevant institutional needs. Specifically, regulatory and permit requirements, community relations needs and the level of agency coordination necessary shall be assessed.

E. Cost Analysis

The Respondent shall evaluate the cost of each feasible remedial action alternative (and for each phase or segment of the alternative). The cost analysis shall include the total cost of implementing the alternative and the annual operating and maintenance costs. Both monetary costs and associated non-monetary costs shall be included. A distribution of cost over time and a present worth analysis shall be provided.

F. Comparison of Alternatives

Alternatives shall be compared using technical, environmental, and economic criteria. At a minimum, the following areas shall be used to compare alternatives.

1. Health Information - For the no-action alternative, U.S. EPA prefers a quantitative statement including a range estimate of maximum individual risks. Where quantification is not possible, a qualitative analysis may suffice. For management of migration measures, the Respondent shall present a quantitative risk assessment including a range estimate of maximum individual risks.

2. Environmental Effects - Only the most important effects or impacts shall be summarized. Reference can be made to supplemental information arrayed in a separate table, if necessary.

3. Technical Aspects of the Remedial Alternatives - The technical aspects of each remedial alternative relative to the others shall be clearly delineated. Such information generally will be based on the professional opinion of the Respondent or their Consultant regarding the site and the technologies comprising the remedial alternative.

   After screening the remedial action alternatives for further evaluation, the Respondent shall evaluate the field investigation studies completed during the remedial investigation. They shall identify any additional engineering studies that will be required during design to fully evaluate the cost, constructibility, applicabilility or reliability of the alternative.

4. Information on the Extent to Which Remedial Alternatives Meet the Technical Requirements and Environmental Standards of Applicable Environmental Regulations - This information shall be arranged so that differences in how remedial alternatives satisfy such standards are readily apparent. The general types of standards that may be applicable at the site include:

   a. RCRA design and operating standards;

   b. Drinking water standards and criteria;

   c. Water quality standards and criteria; and

   d. Air emissions standards.

5. Information on Community Effects - The types of information that shall be provided are the extent to which implementation of a remedial alternative disrupts the community (e.g., traffic, temporary health risks, and relocation).

6. Present Worth of Total Costs - The net present value of capital and operation and maintenance costs must be presented.

7. Other Factors - This category of information would include such things as institutional factors that may inhibit implementing a remedial alternative and any other site-specific factors identified in the course of the detailed analysis that may influence which alternative is eventually selected.

TASK 12 - FEASIBILITY STUDY REPORT PREPARATION

A preliminary report presenting the results of Tasks 8 through 11 will be prepared and submitted by the Respondent to U.S. EPA and OEPA for their review. This report shall be prepared in accordance with the procedures set forth in the Consent Order. This draft report must follow the U.S. EPA document "Guidance on Feasibility Studies under CERCLA" and any other applicable guidance documents provided by U.S. EPA which shall not be inconsistent with the NCP. (Note: U.S. EPA and OEPA retain authority for the final selection of the remedial alternative to be implemented at the site).

A. Draft Report Review Meeting.

The Respondent, the Consultant and their necessary staff shall be available to discuss the Draft Feasibility Study Report with U.S. EPA and OEPA. Prior to these discussions, the Agencies will have provided the Respondent with their specific review comments.

B. Prepare Final Draft Feasibility Study Report

The Respondent shall prepare the final Draft Feasibility Study Report based on the U.S. EPA's and OEPA's review comments prior to making the document available to the public.

C. Community/Public Meetings

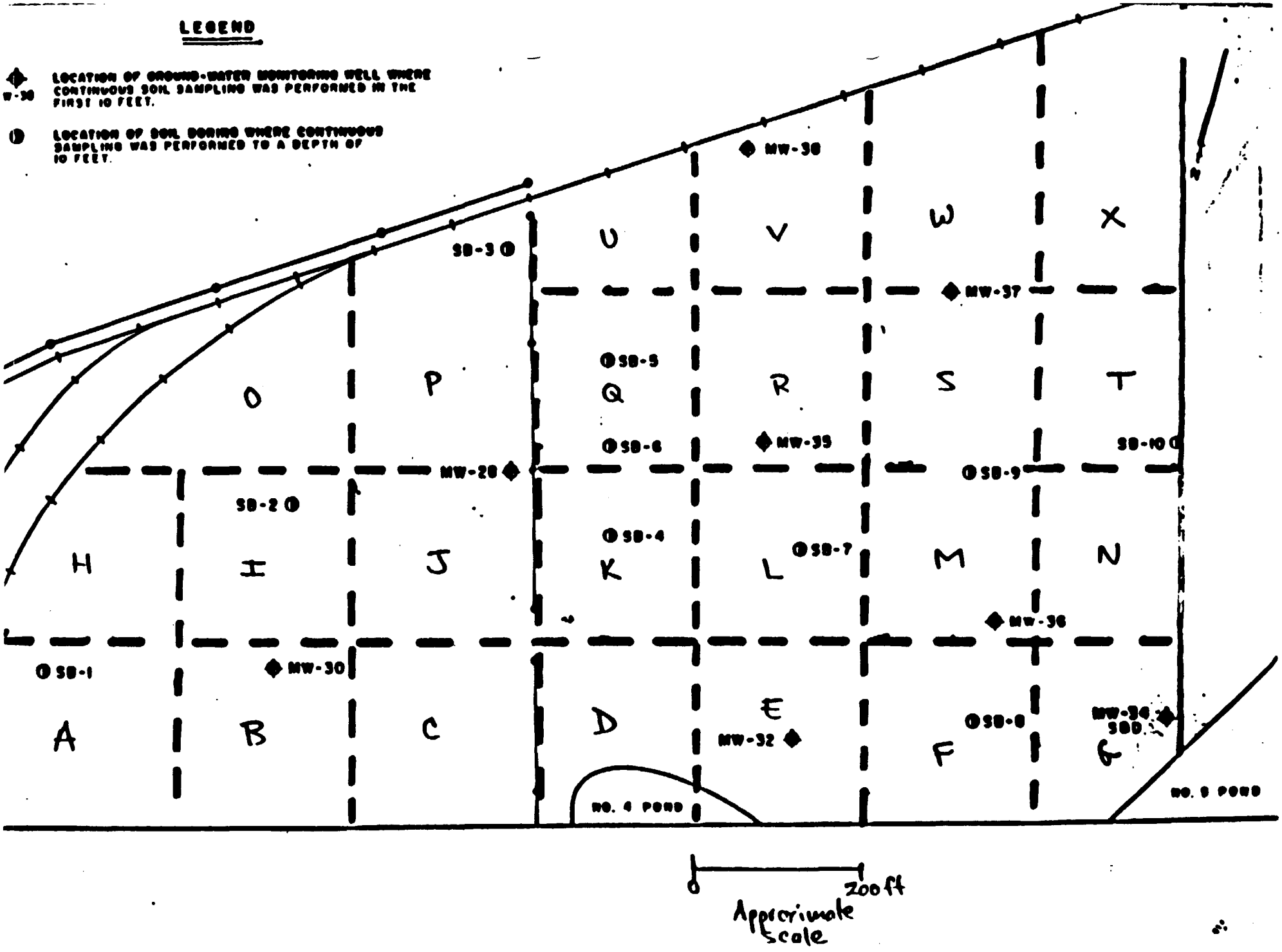
A community/public meeting shall be held following publication of the final Draft Feasibility Study Report. The purpose of this meeting will be to inform citizens of the RI/FS results and to obtain their comments and concerns. If requested, the Respondent and the Consultant shall be present to answer any technical questions. There shall be a minimum three week public comment period following publication of the final Draft Feasibility Study Report.

Following the public review and comment period, U.S. EPA and OEPA shall notify the Respondent of any necessary modifications to the final Draft Feasibility Study Report in order to produce the Final Feasibility Study Report. If it is deemed necessary by the Agencies, the Respondent shall revise the final FS report to incorporate public comments.

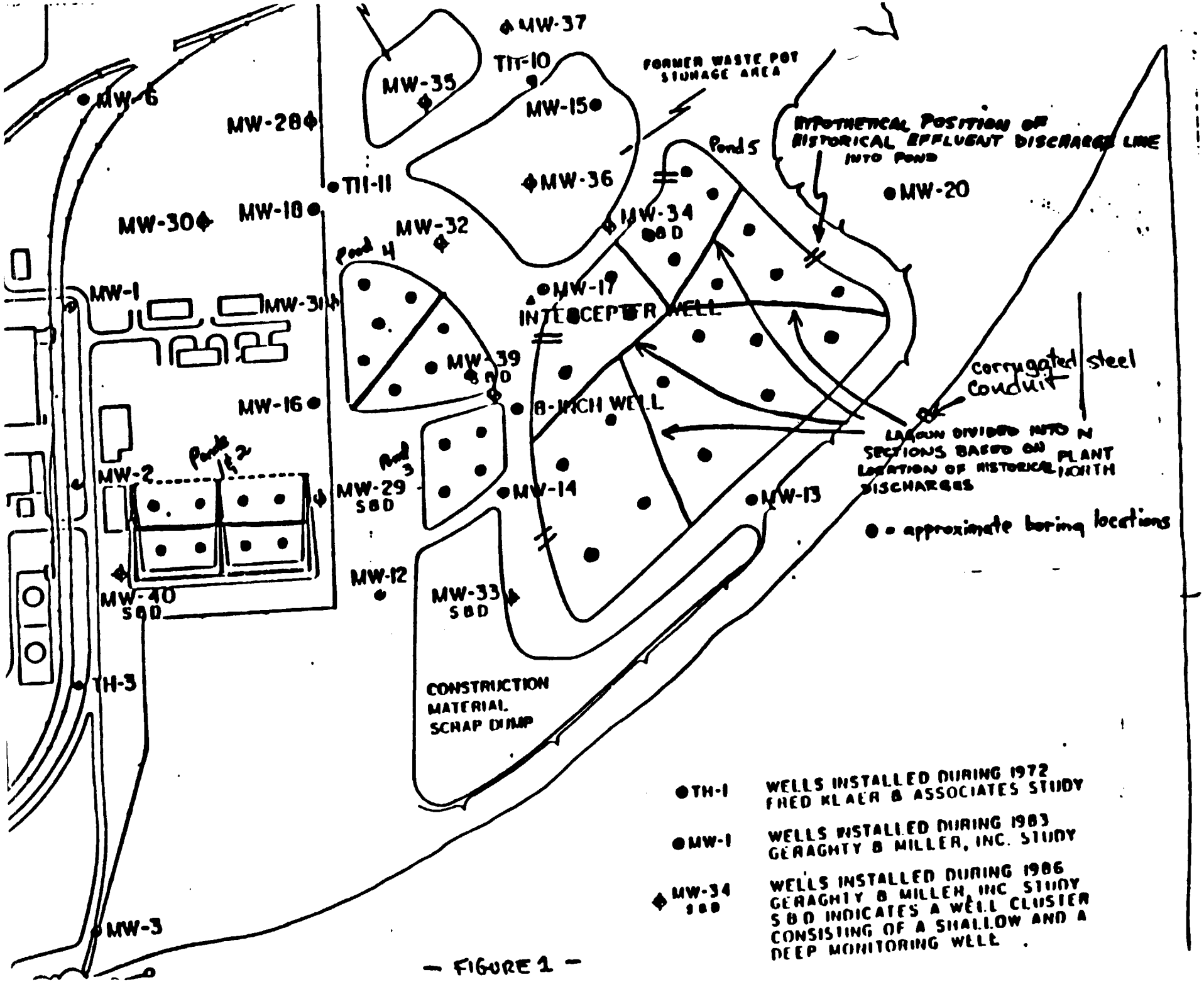
APPENDIX - DELIVERABLES

The following deliverables shall be provided for the tasks outlined in the RI/FS Statement of Work.

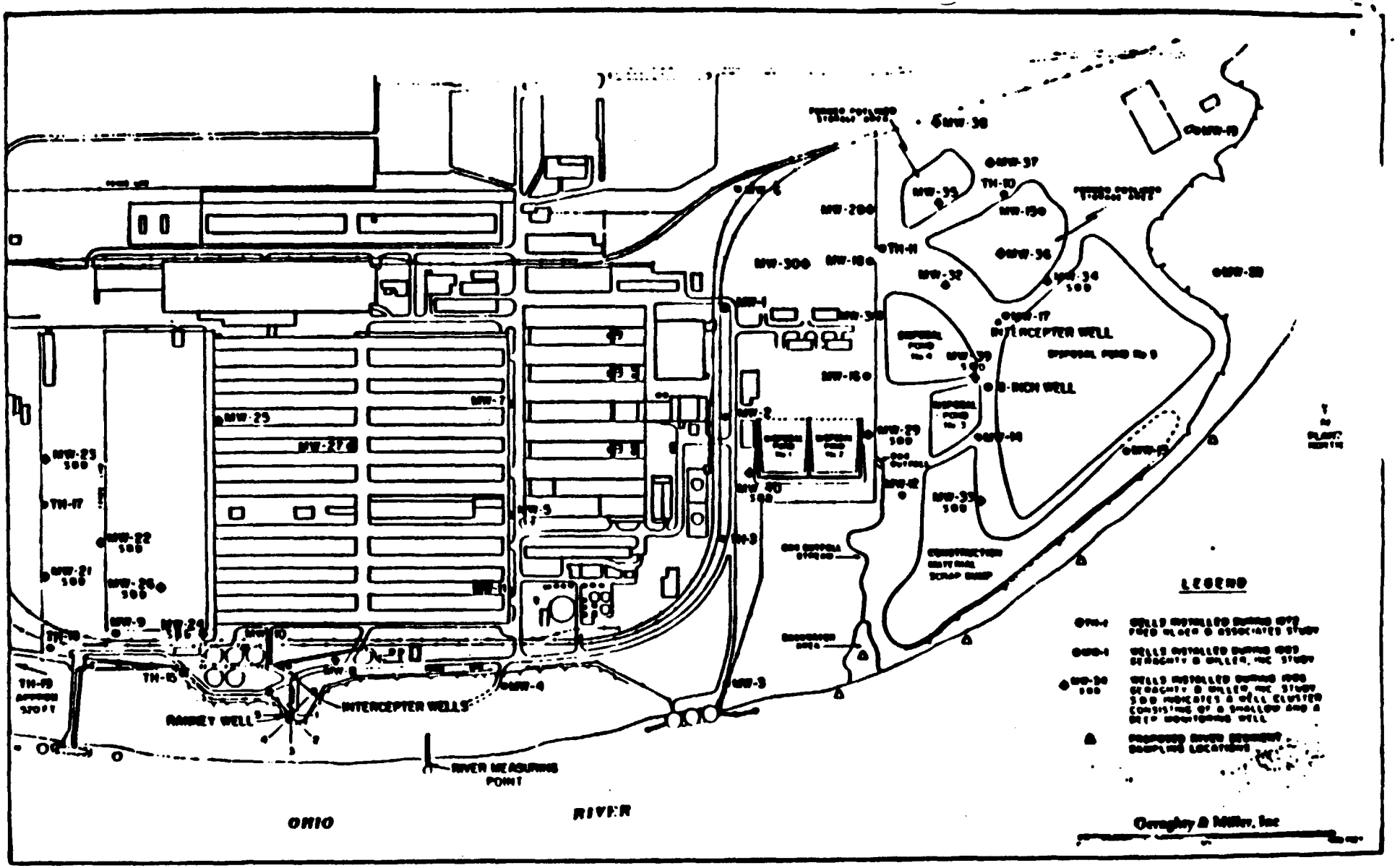
RI/FS TASK	DELIVERABLES
• Task 2	- Draft Phase I RI Work Plan
• Task 2	- Final Phase I RI Work Plan
• Task 4	- Draft Phase II RI Work Plan
• Task 4	- Final Phase II RI Work Plan
• Task 6	- Draft RI Report
• Task 6	- Final RI Report
• Task 7	- Draft FS Work Plan
• Task 7	- Final FS Work Plan
• Task 8	- Draft Technology Assessment Chapter of FS Report
• Task 9	- Draft List of Preliminary Cleanup Objectives
• Task 12	- Draft FS Report
• Task 12	- Final FS Report


LEGEND
LOCATION OF GROUND-WATER MONITORING WELL WHERE CONTINUOUS SOIL SAMPLING WAS PERFORMED IN THE FIRST 10 FEET.
LOCATION OF SOIL BORING WHERE CONTINUOUS SAMPLING WAS PERFORMED TO A DEPTH OF 10 FEET.
MW-38
SB-3
U
V
W
X
MW-37
SB-5
O
P
Q
R
S
T
SB-6
MW-39
SB-10
MW-28
SB-9
SB-2
SB-4
H
I
J
K
L
SB-7
M
N
MW-36
SB-1
MW-30
A
B
C
D
E
MW-32
SB-8
MW-34
SBD
F
G
NO. 4 POND
NO. 5 POND
200 ft
Approximate Scale

– FIGURE 2 –


MW-37
TH-10
MW-35
FORMER WASTE POT STORAGE AREA
MW-6
MW-28
MW-15
HYPOTHETICAL POSITION OF HISTORICAL EFFLUENT DISCHARGE LINE INTO POND
Pond 5
TH-11
MW-36
MW-20
MW-30
MW-18
MW-32
MW-34 SBD
Pond 4
MW-1
MW-31
MW-17
INTERCEPTER WELL
MW-39 SBD
corrugated steel conduit
MW-16
8-INCH WELL
LAGOON DIVIDED INTO N SECTIONS BASED ON LOCATION OF HISTORICAL NORTH PLANT DISCHARGES
Pond 2
MW-2
Pond 3
MW-29 SBD
MW-14
MW-13
● = approximate boring locations
MW-12
MW-33 SBD
MW-40 SBD
TH-3
CONSTRUCTION MATERIAL SCRAP DUMP
MW-3
● TH-1 WELLS INSTALLED DURING 1972 FRED KLAER & ASSOCIATES STUDY
● MW-1 WELLS INSTALLED DURING 1983 GERAGHTY & MILLER, INC. STUDY
◆ MW-34 SBD WELLS INSTALLED DURING 1986 GERAGHTY & MILLER, INC STUDY SBD INDICATES A WELL CLUSTER CONSISTING OF A SHALLOW AND A DEEP MONITORING WELL

— FIGURE 1 —



Proposed river sediment sampling locations, Ormet Corporation, Hannibal, Ohio.

- The background sediment sampling location shall be located upstream from the Ormet Corporation property, but still within the depositional zone of the river meander.

– FIGURE 3 –